

C L A I M S

1. A method for interconnecting tubulars by forge
5 welding, the method comprising: arranging the tubular
ends that are to be interconnected at a selected distance
from each other in a space, which is substantially filled
with a flushing fluid mixture; heating each tubular end
within said space by means of high frequency electrical
10 heating wherein use is made of at least three electrodes
that are pressed at circumferentially spaced intervals
against the wall of each tubular adjacent to the tubular
end such that the electrodes transmit a high frequency
electrical current in a substantially circumferential
15 direction through the tubular segment between the
electrical contacts; and moving the tubular ends towards
each other until a forge weld is formed between the
heated tubular ends.
2. The method of claim 1, wherein the tubular ends are
20 heated by at least two pairs of electrodes and the
electrodes of each pair of electrodes are pressed at
substantially diametrically opposite positions against
the tubular wall.
3. The method of claim 2, wherein the different pairs of
25 diametrically opposite electrodes at each tubular end are
activated in an alternating manner.
4. The method of claim 2 or 3, wherein two pairs of
diametrically opposite electrodes are pressed at angular
intervals of substantially 90 degrees against the tubular
30 wall.
5. The method of claim 2 or 3, wherein three pairs of
diametrically opposite electrodes are pressed at angular

intervals of substantially 60 degrees against the tubular wall.

6. The method of claim 1, wherein each tubular end has a substantially cylindrical shape and three electrodes are pressed against the wall of each tubular adjacent to the tubular end at angular intervals of substantially 120 degrees relative to a central axis of the tubular and wherein the electrodes that are pressed against the walls of adjacent tubulars form pairs of adjacent electrodes that are arranged in close proximity to each other and substantially in the same axial plane and the pairs of adjacent electrodes are actuated such that the these electrodes have substantially opposite polarities.

7. The method of any preceding claim, wherein the tubulars have an irregular shape and the electrodes are positioned at selected angular intervals relative to a longitudinal axis of the tubulars such that the tubular ends are heated in a substantially equal manner.

8. The method of claim 7, wherein the tubulars are multibore tubulars.

9. The method of claim 8, wherein the multibore tubulars each comprise an enveloping pipe and one or more partitioning walls, which divide the interior of the enveloping pipe into at least two semi-cylindrical segments.

10. The method of claim 9, wherein the enveloping pipe comprises a partitioning wall which is secured in an electrically conductive manner to the inner wall of the enveloping pipe at substantially diametrically opposite positions relative to a central axis of the enveloping pipe.

11. The method of claim 8, wherein the multibore tubulars comprise an enveloping pipe and one or more small

diameter pipes are arranged in the interior of the enveloping pipe and the walls of the enveloping and small diameter pipes are in electrical contact with each other.

12. The method of claim 8, wherein the multibore tubulars are formed by pipe bundles and the walls of the adjacent pipes are in electrical contact with each other.

13. The method of any preceding claim, wherein the flushing fluid mixture comprises a mixture comprising less than 25% by volume of a reducing fluid and more than 75% by volume of a substantially inert gas.

14. The method of claim 13, wherein the flushing fluid mixture is a mixture of a reducing fluid which comprises hydrogen and/or carbon monoxide and/or a liquid reducing agent and a substantially inert gas which comprises nitrogen and/or carbon dioxide and/or a noble gas such as argon.

15. The method of claim 13 or 14, wherein the flushing fluid mixture comprises between 2 and 15% by volume of reducing fluid and between 85 and 98% by volume of a substantially inert gas.

16. The method of claim 13, 14 or 15 wherein a liquid or solid reducing agent is painted or sprayed at the tubular ends and an inert gas is injected into said space, whereupon the reducing agent is at least partly evaporated when the tubular ends are heated and the evaporated reducing agent is mixed with the injected inert gas to form in-situ a flushing gas mixture comprising less than 25% by volume of evaporated reducing agent and more than 75% by volume of a substantially inert gas.

17. The method of claim 16, wherein the liquid or solid reducing agent comprises a cleaning liquid, such as hydrochloric acid, and a reducing agent, such as hydrogen

peroxide, borax powder and/or an alkaline or beryllium hydride.

18. The method of any one of claims 1-17, wherein the tubulars are oilfield or well tubulars.

5 19. The method of any one of claims 1-18, wherein the quality of the forge weld formed between the interconnected tubulars is inspected by means of an electromagnetic acoustic inspection technique, which is known as EMAT and wherein induction coils are placed at
10 both sides of the forge welded, which coils are held at a predetermined distance from the tubulars during the inspection process.

20. A system for use in the method of claim 1, the system comprising a gripping assembly for arranging the tubular
15 ends that are to be interconnected at a selected distance from each other in a space, flushing fluid injection means for filling said space with a flushing fluid mixture; an electrode assembly for heating each tubular end within said space by means of high frequency
20 electrical heating wherein the electrode assembly comprises at least three electrodes that are pressed at circumferentially spaced intervals against the wall of each tubular adjacent to the tubular end such that the electrodes transmit in use a high frequency electrical
25 current in a substantially circumferential direction through the tubular segment between the electrodes; and means for inducing the gripping assembly to press the heated tubular ends against each other until a forge weld is formed between the heated tubular ends.

30 21. The system of claim 20, wherein the gripping assembly is configured to maintain the tubular ends at a predetermined spacing during the heating phase and comprises a mechanical stop which is configured to

interrupt the axial movement of the heated tubular ends during the forge welding process when the heated tubular ends have moved along a predetermined distance towards and squeezed into each other.